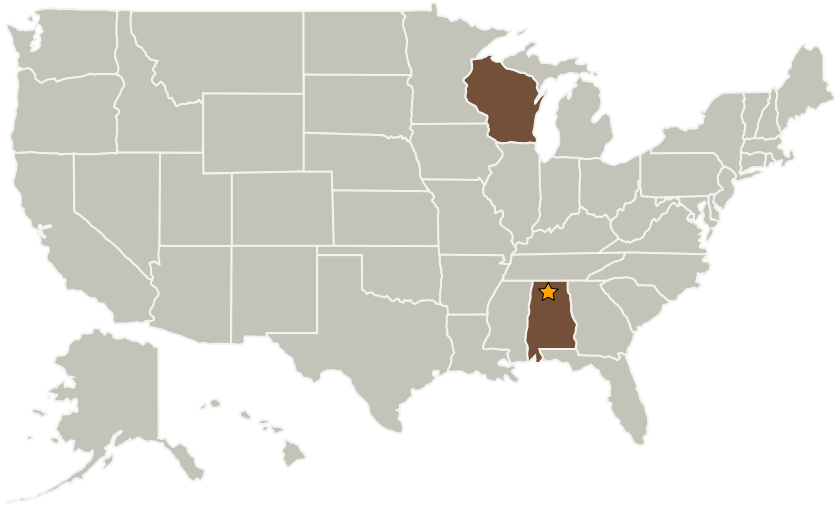
High-Fidelity Lunar Dust Simulant, Phase II

Completed Technology Project (2009 - 2011)

Project Introduction

The severity of the lunar dust problems encountered during the Apollo missions were consistently underestimated by ground tests, illustrating the need to develop significantly better lunar dust simulants and simulation facilities. ORBITEC is proposing to continue developing high-fidelity lunar dust simulants that better match the unique properties of lunar dust than existing regolith simulants (such as JSC-1AF). Current lunar regolith simulants do not have enough of the very fine particles, most lack the agglutinitic glass and complex surface textures that dominate lunar dust, and none of them have nanophase iron (Fe0). High-fidelity lunar dust simulants approximate the size, morphology, composition, and other important properties of lunar dust (including nanophase Fe0). High-fidelity lunar dust simulants are required to physically evaluate the effects of lunar dust on the operation of all Exploration Surface Systems and to verify the effectiveness of dust mitigation strategies and technologies. During Phase 1, several prototype lunar dust simulants were created, samples of the prototype lunar dust simulants were delivered to NASA for characterization (TRL 4). The proposed Phase 2 effort will refine and demonstrate the production process for lunar dust simulants that will be characterized and delivered to NASA for a variety of applications (TRL 6).

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Orbital Technologies Corporation	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Madison, Wisconsin

Primary U.S. Work Locations	
Alabama	Wisconsin

Project Transitions

February 2009: Project Start

August 2011: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.2 Mission Infrastructure, Sustainability, and Supportability
    - TX07.2.5 Particulate Contamination Prevention and Mitigation